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APPLICATION NO	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO	CONFIRMATION NO.
10/033,394	12/28/2001	Seong-jae Lee	2013p006	8538

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EXAMINER
NGUYEN, KHIEM D

ART UNIT	PAPER NUMBER
2823	

DATE MAILED: 01/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/033,394	LEE ET AL.	
	Examiner	Art Unit	
	Khiem D Nguyen	2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133)
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic prionty under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *3*
4) ☐ Interview Summary (PTO-413) Paper No(s) _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Byun et al. (U.S. Patent 5,599,734) in view of Kroner et al. (IEEE 2000).

Byun teaches a method of fabricating an integrated circuit comprising (col. 3, line 29 to col. 4, line 17 and FIGS. 2(a-c)):

forming a gate pattern (22, 23) on a semiconductor substrate 21 (col. 3, lines 29-32);

forming a SOG layer 24 containing impurities on the entire surface of the semiconductor substrate wherein the SOG layer is formed by spin-coating and densifying a liquid silicate glass or CVD including P and B doping elements (col. 3, lines 33-57 and FIG. 2b) and wherein the ratio of the thickness of the SOG layer to the height of a gate electrode constituting the gate pattern is between 1:1.5 and 1:10;

diffusing the impurity ions contained in the SOG layer into the semiconductor substrate by a solid phase diffusion method using rapid thermal annealing at a temperature of 800-1100 °C (col. 4, line 17) to form shallow junctions having a LDD region and a highly doped source/drain region 25 self-aligned underneath both sidewalls

of the gate pattern (col. 3, lines 38-40) wherein the shallow junctions having a doping depth of 50nm or less (col. 4, lines 26-28).

Byun fails to disclose additionally implanting impurity ions into the SOG layer by a plasma ion implantation method to increase the concentration of impurities in the SOG layer using a plasma ion implanter including a Plasma Immersion Ion Implanter (PIII) and an Ion Shower Implanter (ISI) as recited in present claims 1, 4, 11 and 15.

Kroner et al. disclose (page 476) additionally implanting impurity ions into the SOG layer by a plasma ion implantation method using a plasma ion implanter including an Ion Shower Implanter (ISI). It would have been obvious to one of ordinary skill in the art of making semiconductor devices to incorporate Kroner's teaching into Byun's method to implant impurity ions into the SOG layer by a plasma ion implantation method to increase the concentration of impurities in the SOG layer using a plasma ion implanter including an Ion Shower Implanter (ISI) because it is a doping method for high dose and low energy implants.

Byun fails to disclose the ranges for the maximum impurity implantation concentration of the SOG layer and doping concentration of the shallow junctions as recited present claims 5, 10, 16 and 20.

However, there is no evidence indicating that the ranges for the maximum impurity implantation concentration of the SOG layer and doping concentration of the shallow junctions are critical and it has been held that it is not inventive to discover the optimum or workable ranges of a result-effective variable within given prior art conditions by routine experimentation. See MPEP 2144.05.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (703) 306-0210. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chaudhuri Olik can be reached on (703) 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 746-9179 for regular communications and (703) 746-9179 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.N.
January 5, 2003

George Fourson
Primary Examiner
2823